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Committee of Experts on the Transport of Dangerous Goods and on the Globally Harmonized System of Classification and Labelling of Chemicals

Sub-Committee of Experts on the Transport of Dangerous Goods

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Item 3 of the provisional agenda
Listing, classification and packaging

Review of the definition of infectious substance and the table in 2.6.3.2.2.1

Transmitted by the expert from Canada*

Introduction

1. *The United Nations Recommendations on the Transport of Dangerous Goods* (Model Regulations) include infectious substances as dangerous goods, and as such it provides recommendations to transport them safely.

2. To assist consignors in properly classifying infectious substances, the Model Regulations include a list of infectious substances in the table of "*Indicative examples of infectious substances included in Category A in any form unless otherwise indicated (2.6.3.2.2.1 (a))*" (table of indicative examples in 2.6.3.2.2.1. This list comprises some of the most dangerous infectious substances.

3. Researchers and medical professionals involved in the transportation of infectious substances rely on the expertise of the Sub-Committee to classify infectious substances. The international scientific community also relies on the *International Committee on Taxonomy of Viruses* (ICTV). This committee, formed by virologists and taxonomy experts, is responsible for naming and grouping viruses based on shared properties.

* In accordance with the programme of work of the Sub-Committee for 2017–2018 approved by the Committee at its eighth session (see ST/SG/AC.10/C.3/100, paragraph 98 and ST/SG/AC.10/44, para. 14).

4. To align with current scientific terminology used worldwide, the Model Regulations should adopt the correct nomenclature of infectious substances. The following section suggests changes to the 20th revised edition of the Model Regulations.

Proposal

5. Amend sub-section 2.6.1 (b) and paragraph 2.6.3.1, which reads:

"These are substances known or reasonably expected to contain pathogens. Pathogens are defined as microorganisms (including bacteria, viruses, rickettsiae, parasites, fungi) and other agents such as prions, which can cause disease in humans or animals."

Issue: This statement may create confusion because it implies that rickettsia are different organisms from bacteria. Rickettsia, indeed, are obligate intracellular gram-negative bacteria.

Solution: Amend sub-section 2.6.1 (b) and paragraph 2.6.3.1 as follows, with deleted text in ~~strikethrough~~:

"These are substances known or reasonably expected to contain pathogens. Pathogens are defined as microorganisms (including bacteria, viruses, ~~rickettsiae,~~ parasites, fungi) and other agents such as prions, which can cause disease in humans or animals."

6. Amend paragraph 2.6.3.2. Note 3, which reads:

"In the following table, the microorganisms written in italics are bacteria, mycoplasmas, rickettsia or fungi."

Issue: This statement may create confusion because it implies that mycoplasmas and rickettsia are different organisms than bacteria. Mycoplasmas and rickettsia, indeed, are obligate intracellular gram-negative bacteria.

Solution: Amend paragraph 2.6.3.2.2.2 Note 3 as follows, with deleted text in ~~strikethrough~~:

"In the following table, the microorganisms written in italics are bacteria, ~~mycoplasmas, rickettsia~~ or fungi."

Proposals to modify the table of indicative examples in 2.6.3.2.2.1

7. **Add** "Ebolaviruses" under "UN 2814 Infectious substances affecting humans"

Justification

The family of ebolaviruses is comprised of 5 members: Bundibugyo virus, Reston virus, Sudan virus, Tai Forest virus, and Ebola virus. Despite their different geographical distribution and case fatality rate, the name Ebola virus is still erroneously used for other ebolaviruses.[1] For instance, Bundibugyo virus and Sudan virus have been associated to the outbreaks in Uganda, while Ebola virus has never been detected in this geographical area. In addition, lethality of Bundibugyo virus and Sudan virus disease outbreaks is usually around 50% or lower, whereas Ebola virus disease outbreaks often reach 80% or more.[2] To encompass the other members of ebolaviruses, as well as to acknowledge their importance as a public health threat, "ebolaviruses" should be included in the table of indicative examples.

8. **Remove** "Human immunodeficiency virus (culture only)" entry under "UN 2814 Infectious substances affecting humans", and **add** "Human immunodeficiency virus 1 (culture only)" and "Human immunodeficiency virus 2 (culture only)"

Justification

There are two types of the human immunodeficiency virus: human immunodeficiency virus 1 (HIV-1) and human immunodeficiency virus 2 (HIV-2). While both viruses are responsible for HIV disease, there are differences among them. For instance, HIV-1, predominant worldwide, has a high infectivity rate and is more pathogenic than HIV-2. While endemic in West Africa, HIV-2 has a lower transmission efficiency and is less pathogenic. [3, 4, 5, 6] As a consequence, diagnosis and treatment vary. [6] To confer precision and concede scientific knowledge, it is proposed to add both names in the table of indicative examples.

9. **Modify** "Junin virus" entry to "Junin virus", and "Sabia virus" entry to "Sabiá virus" under "UN 2814 Infectious substances affecting humans"

Justification

Junin virus and Sabia virus are endemic to Spanish/Portuguese-speaking countries. These countries use Latin alphabets, including diacritical marks (e.g. accents). However, the names of Junin virus and Sabia virus have been traditionally written without accents. This changed in 2014, when the ICTV approved the use of accents, adopting the names Junin virus and Sabiá virus.[7] At the time this paper was written, the addition of accents did not affect searchability. For example, searches in the specialized database PubMed for both Junin virus spellings resulted in 733 matches, while searches for both Sabia virus spellings resulted in 812 matches. Thus, to concede scientific knowledge, it is proposed to adopt "Junin virus" and "Sabia virus".

10. **Remove** "Russian spring-summer encephalitis virus (cultures only)" entry under "UN 2814 Infectious substances affecting humans"

Justification

Tick-borne encephalitis virus and Russian spring-summer encephalitis virus are both included in the table of indicative examples, suggesting that they are both different viruses. However, in the scientific community Tick-borne encephalitis virus is widely used in place of the Russian spring-summer tick-borne encephalitis virus. Inclusion of both names in the table of indicative examples is redundant, and thus unnecessary.

11. **Add** "smallpox virus" in parentheses following "Variola virus", as follows:

"Variola virus (smallpox virus)" under "UN 2814 Infectious substances affecting humans"

Justification

Variola virus, better known as smallpox virus, is responsible for causing smallpox disease. Due to the widespread usage of "smallpox", and to facilitate classification of "Variola virus" for transportation, it is recommended that "smallpox virus" be introduced in the table of indicative examples. At the time this paper was written, adding "smallpox virus" to the list improved searchability. For instance, a search for "Variola virus" in PubMed, resulted in 2437 matches, whereas "smallpox virus" resulted in 4076 matches.

12. **Replace** "Foot and mouth disease virus" **with** "Foot-and-mouth disease virus" under "UN 2900 Infectious substances affecting animals only"

Justification

According to taxonomy experts [8], the proper writing of "Foot and mouth disease virus" is "Foot-and-mouth disease virus." At the time this paper was written, the addition of hyphen did not affect searchability. For example, a search in PubMed for both "foot-and-mouth virus" and "foot and mouth virus" resulted in 5963 matches equally. Thus, to concede scientific knowledge, it is proposed to adopt "Foot-and-mouth disease virus".

13. **Replace** "Sheep-pox virus" **with** "Sheeppox virus" under "UN 2900 Infectious substances affecting animals only"

Justification

According to taxonomy experts[8], the proper writing of "Sheep-pox virus" is "Sheeppox virus." At the moment this paper was written, the removal of the hyphen affected searchability. For example, a search in the specialized database PubMed for "sheeppox virus" resulted in 303 matches, compared to 373 matches for "sheep-pox virus". Despite this difference, the expert of Canada believes that aligning with the recommendations of the scientific community would ensure proper classification of infectious substances, and thus transporting these substances safely.

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